

Keeping your Dog Healthy

Caring for Brachycephalic Dog Breeds



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What is a 'Brachycephalic' Dog, and why do they need extra care?

Brachycephalic dogs belong to those breeds that have generally wider, shortened heads and in particular they have a foreshortened muzzle. There is no universally agreed list of brachycephalic breeds because like many breed characteristics there is a wide spectrum of head lengths which aren't clearly delineated into brachycephalic (short), mesocephalic (average) and dolichocephalic (long head). Some breeds are obviously 'brachy' like the Affenpinscher, Boston Terrier, Boxer, British and French Bulldog, Griffon Bruxellois, Japanese Chin, Pekingese, Pug, Lhasa Apso and Shih Tzu. Other breeds like the Bullmastiff, Cavalier and King Charles Spaniels, Chihuahua, Chow Chow, Dogue de Bordeaux, Neapolitan Mastiff, Staffordshire Bull Terrier, Tibetan Spaniel, Pomeranian and Maltese may be considered closer to or even being a mesocephalic length head and could be expected to experience BOAS (Brachycephalic Obstructive Airway Syndrome) respiratory problems less frequently.

It isn't just purebred dogs that can be affected by BOAS but also many brachycephalic crossbred or 'designer' dogs or breeds not yet recognised by the ANKC (Australian National Kennel Council) such as the Australian Bulldog. However, Dogs Victoria Breeders are bound by both Dogs Victoria and ANKC Code of Practice for Hereditary Diseases, to breed responsibly to reduce diseases in their breed which can involve both mandatory and recommended Health Testing of their dogs.



Pug



Bulldog



French Bulldog

What is Brachycephalic Obstructive Airway Syndrome (BOAS)?

The consequence of breeding dogs with foreshortened heads is that all those intricately scrolled masses of nasal tissue along with the soft palate are compressed into a relatively smaller space which in turn can lead to airway obstruction. Airway obstruction compromises your ability to breathe and clinically affected dogs in even normal conditions can struggle to cope with reasonable activity like exercise, play, eating, drinking and sleeping.

In addition to the varying degrees of compressed nasal tissues that all brachycephalic dogs have, there are four other abnormalities associated with brachycephaly that contribute to this syndrome which can progressively worsen over time;

- **Stenotic Nostrils (Nares).** Where the nostrils are narrowed or even occluded. Affected dogs will tend to snuffle, snort, snore and make more noise as they try to breathe through these restricted nasal openings. As a result, they will tend to breathe through their mouth more readily than other dogs.

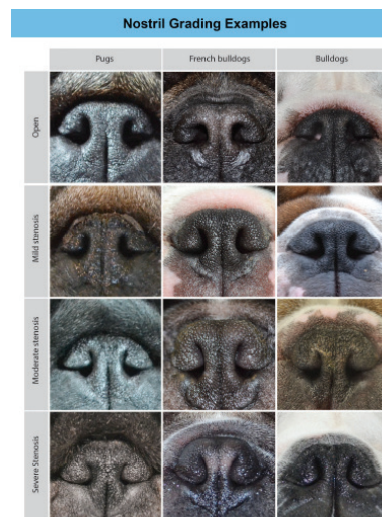


Figure 1. Photos of open (desired) and degrees of stenotic nares in three examples of brachycephalic breeds. (University of Cambridge, Department of Veterinary Medicine)

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- **Elongated Soft Palate.** The soft palate is that muscular flap that is the continuation of the bony roof of the mouth known as the hard palate. One of its functions is that it will elevate and cover over the back of the nasal passages (nasopharynx) when we swallow food. What stops the food being swallowed from otherwise entering our trachea (windpipe) is a stiff flap of cartilage at the front of the larynx called the epiglottis. The epiglottis will elevate when we swallow and so seal the entrance to the larynx, which contains the vocal folds before opening into the trachea.



Figure 2. Normal length soft palate Image provided by the author

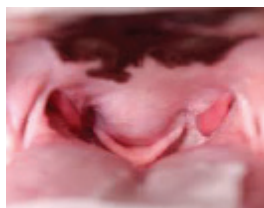


Figure 3. Elongated soft palate Image source (Fitzpatrick Referrals Limited)

- In the photos above, you'll see that the epiglottis looks like the bow of a ship appearing behind the tongue. The soft palate is a perfect length as it just reaches over the front aspect of the epiglottis. A dog with an elongated soft palate will see the soft palate extending much further back so that it will partially obstruct the flow of air into the larynx and trachea. These dogs have a loud rasping and sometimes gagging respiration. Sometimes these dogs have episodes where they have trouble catching their breath taking those open mouth, deep backward inspiratory snorting respirations with their head elevated. That's an episode where the soft palate has become trapped inside the laryngeal opening. An occasional episode of soft palate entrapment could be considered normal for a brachycephalic breed but if it is happening more frequently then surgical treatment becomes an option. Over time an elongated soft palate becomes inflamed and thickened and sometimes the tonsils also can become inflamed and enlarged which can also cause progression of airway obstruction. The tonsils seen either side of the epiglottis of the dog in Figure 3 are enlarged.

- Hypoplastic trachea (windpipe). This is where their trachea is of a smaller diameter than it should be which further exacerbates any breathing difficulties. Fortunately, this is a rarer defect in many brachycephalic breeds but is sometimes seen in British Bulldogs and related breeds.
- Everted laryngeal sacculles. This is where these small membrane lined pouches that are found tucked into either side of the vocal cords inside the larynx are sucked out into the laryngeal airway and so further obstruct airflow. This is always a consequence of the increased respiratory pressure exerted on the larynx due to having one or more of the other defects described above.

What are the Symptoms of BOAS?

Some symptoms of **BOAS** are obvious and will be worse when the dog experiences stress such as exercise and warm weather conditions. Signs to watch for include;

- Loud snoring when asleep or even snoring and noisy breathing when awake.
- Panting excessively, especially in warmer conditions and if exercising or excited.
- Collapse! A dog with BOAS will take longer to recover from exercise and especially in warmer conditions can struggle to both breathe and regulate their temperature which leads to Heat Stroke and also collapse. This is an emergency situation where the dog's gums and tongue can become cyanotic (blue/purple in colour) and they can lose consciousness before death.
- Difficulty swallowing when eating and drinking especially if they are struggling to breath.
- Regurgitating or vomiting saliva or food and water due to the ongoing exaggerated efforts of both chest and abdominal muscles to assist breathing. Some dogs will even develop a hiatal hernia of their stomach and ulceration of their oesophagus near the stomach.

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Do all Brachycephalic dogs have BOAS and how do we reduce the incidence of BOAS?

No, they don't. Although it is reasonable to expect any brachycephalic breed to have increased respiratory sounds when exercised or otherwise stressed compared to other breeds, this is not the same as having clinical BOAS where the symptoms are adversely impacting on the dog's quality of life. It is possible to breed brachycephalic dogs free of BOAS and other problems that are associated with brachycephaly by selecting breeding dogs and bitches of excellent health characteristics such as large open nostrils, excellent chest capacity and of course, free of BOAS symptoms themselves.

Dogs Victoria registered breeders are bound by a **Code of Practice** to select sound breeding dogs and bitches to improve the health of their breed and many carry out further health testing to this end. Some examples of additional Health tests undertaken by Dogs Victoria brachycephalic breeders are;

- Griffon Bruxellois and Cavalier King Charles Spaniel breeders who perform MRI scanning of the skulls of dogs and bitches they intend to use for breeding in order to minimise the incidence of SM/CM (Syringomyelia/Chiara-like malformation) in these breeds.
- Cavalier King Charles Spaniel breeders who participate in Veterinary Cardiologist examination clinics of their breeding dogs to reduce the incidence of early onset mitral valve disease.
- French Bulldog, Boston Terrier and Pug breeders who submit spinal X-rays of their dogs for scoring to reduce incidence of abnormal hemivertebrae and associated back pain and neurological symptoms in their breeds.
- Many breeders of brachycephalic dogs have breeding dogs assessed for eye diseases by Veterinary Ophthalmologists (**Australian Canine**

Eye Scheme (ACES) but especially Affenpinscher, Boston Terrier, Bullmastiff, Cavalier King Charles Spaniel, Staffordshire Bull Terrier and Tibetan Spaniel breeds have known Recognised Hereditary Conditions (Schedule 1) occurring in their breeds and many breeders will have breeding stock and sometimes pups assessed. Some of these conditions have DNA tests available.

However, it isn't just our breeders who should take responsibility for reducing **BOAS** and other health problems that can occur in brachycephalic dogs but also **ANKC Conformation Show Judges**. Judges should be continually updating their knowledge of brachycephalic health and not award dogs showing symptoms of **BOAS** as they move around the show arena or other diseases e.g. stenotic nostrils, excessive facial folds causing eye irritation and/or dermatitis.

Until recently there has been no specific measurable test to identify those dogs and bitches that would most be suitable for breeding to reduce the incidence of BOAS available to breeders in Australia, however, **Dogs Victoria** as part of the **ANKC (Australian National Kennel Council)** is anticipating making the test described below available to specific breeders in the near future.

The Kennel Club/University of Cambridge Respiratory Function Grading Scheme

The Scheme involves a simple test that can be performed by an accredited veterinarian who gives a grading to the degree of **BOAS** symptoms the dog has following a standardised exercise test. This grading is used to select which dogs should be used for breeding in order to reduce the incidence of BOAS. This was launched in the UK after almost 10 years research because of concerns that the **Kennel Club**, the controlling Body overseeing Purebred dog activities in the UK, had regarding the impact of **BOAS** in three particularly high-profile brachycephalic breeds. These breeds are the Pug, British Bulldog and French Bulldog and it was breeders of those dogs in the UK that participated in the research to find an affordable and effective test. Through the auspices of the **Kennel Club / University of Cambridge** the test will shortly be introduced in Australia and be available to **Australian breeders of Pugs, British and French Bulldogs**.

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I think my dog has BOAS, is there any treatment?

Visit your vet, who after an examination of your dog and discussion about the severity and frequency of your dog's symptoms will come up with a plan. Sometimes in mild cases it will simply be avoiding warmer conditions and certainly not vigorous exercise in those conditions.

Some overweight dogs with **BOAS** can have significant improvement with a weight reduction plan and not require further treatment. However, if your dog has obviously stenotic nares and respiratory distress with even reasonable levels of activity then your vet may discuss **Brachycephalic Obstructive Airway Syndrome surgery** with you.

This surgery involves cutting out a wedge of tissue from each obstructed nostril whilst the dog is under a general anaesthetic and after suturing the cut edges back together the nostril openings will be more open and allowing a better flow of air.

Your vet will also examine the soft palate when they insert the endotracheal tube that is required for the delivery of oxygen and gaseous anaesthetic, through the larynx into the trachea. If the soft palate is too long, then the vet will resect the excess tissue and suture the mucous membrane that covers the nasopharyngeal and oropharyngeal surfaces of the soft palate over the exposed cut muscular tissue. It is a simple surgery in theory but is fiddly and best done by a vet experienced in doing this procedure. Sometimes weight reduction in those overweight patients is recommended before booking in for surgery and the vet may dispense antibiotics and anti-inflammatory medication to start before and continue several days after surgery to minimize infection, post-op swelling and discomfort. If your dog has everted laryngeal sacculles, then these are simply resected during the same operation.

Do tell your dog's breeder if surgery was necessary as this information may be beneficial for their future breeding plans. Figure 4. Conformational Risks of BOAS in three examples of brachycephalic breeds. (University of Cambridge, Department of Veterinary Medicine)

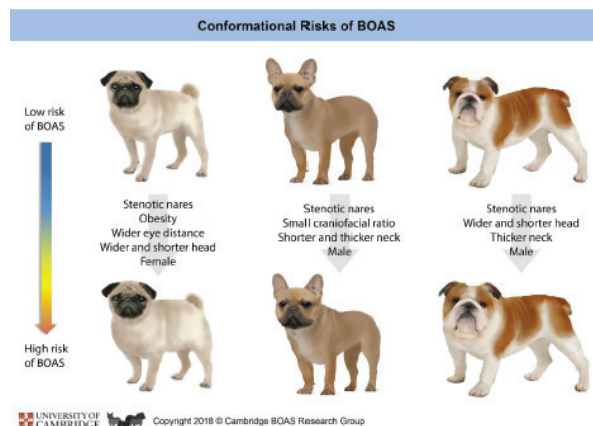


Figure 4. Conformational Risks of BOAS in three examples of brachycephalic breeds. (University of Cambridge, Department of Veterinary Medicine)

Care of a brachycephalic dog

All of our brachycephalic dog breeds were bred to fulfil particular functions whether that of a toy size companion dog like a Japanese Chin, Pug or Pekingese or a dog that sat alongside a horse drawn taxi coach driver in Brussels like a Griffon Bruxellois or even for a fortunately nowadays banned practice like bull baiting such as a British Bulldog. None of them were bred as working or high-performance dogs and so we can't always expect our brachys to run alongside us in the park or on the beach without causing problems!

- Ideally purchase your 'brachy' from a Dogs Victoria or other ANKC Affiliated Body breeder who does Health testing as discussed above and who is bound by both their Affiliated Body and ANKC National Code of Practice for Hereditary Diseases.
- Discuss with your vet whether Kennel Cough vaccinations that are administered subcutaneously are a better option than intranasal /oral Kennel Cough vaccines that can occasionally induce Kennel Cough symptoms that can affect brachycephalic dogs more severely.

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- Avoid strenuous activities and especially on warm days. Always have plenty of fresh water available!
- On hot days, keep indoors and use air conditioning if possible. Otherwise, 'Cool' mats and vests which are soaked with water prior to supplying or fitting to the dog and stay cool for up to a few hours can be used in addition to supplying shade outside.
- Take drinking water and foldable soft bowl when exercising.
- Brachycephalic breeds must not be allowed to become overweight. Feed an appropriate amount of food and do exercise, but not strenuously and not on warm days! This is difficult especially with Pugs who are the Labradors of the toy dog world in regard to appetite!
- Consider attaching your dog's lead to a harness rather than a collar when on walks.
- Do take care of your dog's teeth, many brachycephalic dogs have dental crowding and are prone to periodontal disease.
- Do monitor the eyes and any skin folds for signs of irritation and discharge. Many brachycephalic dogs can have relatively short and tortuous tear ducts which can become blocked and/or facial folds that can become infected or impinge upon the eyes.
- Monitor your dog for signs of BOAS and do consult your vet if any concerns about their respiratory effort and noise. Do inform your dog's Breeder if medical or surgical treatment is required as this information may assist their breeding program.
- If your dog experiences Heat Stroke symptoms e.g. respiratory distress, collapse, hypersalivation, then immediately arrange emergency vet attention and start reducing the body temperature using cool water bath to immerse a smaller dog in or hosing with water with larger dogs and then applying wet towels especially to the tummy and groin areas when transporting to a vet.

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Original Reference List

Codes of Practice

<https://dogsvictoria.org.au/uploads/Regulations%2015%20December%202019.pdf> scroll to 20.320.3 CODE OF PRACTICE FOR HEREDITARY DISEASES

<http://ankc.org.au/AboutUs/?subid=1179&id=1078>

Specific Health Testing Scheme Information

BOAS

<https://www.thekennelclub.org.uk/health-for-breeders/respiratory-function-grading-scheme/>

SM/CM

<https://www.thekennelclub.org.uk/health-for-breeders/complex-inherited-disorders/>

[bvakc-health-schemes/bvakc-chiari-malformations/ringomyelia-scheme/](https://www.thekennelclub.org.uk/health-for-breeders/bvakc-chiari-malformations/ringomyelia-scheme/)

Cavalier King Charles Spaniel Cardiac Disease

<https://www.cprvictoria.com.au/cavalier-king-charles-spaniel/>

Spinal Score Testing

<https://www.frenchbulldogclubnsw.asn.au/Health-grading.php>

Eye Testing

<https://www.ava.com.au/contentassets/bd01fbd49da4bf68ff20f8698c494c4/aces-quick-reference-guide.pdf>